

**TWO NEW SPECIES OF *MACRUROHELEA* FROM CHILE  
WITH A KEY TO THE NEOTROPICAL SPECIES  
(DIPTERA: CERATOPOGONIDAE)**

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Ingram and Macfie (1931) described *Macrurohelea* for two species from southern South America, *M. caudata* I. & M., the type species, and *M. thoracica* I. & M. Wirth (1965) presented a revised diagnosis of the genus, described two new species from Chile, and offered a key to separate the known species. He also discussed the relationship of the genus with *Stilobezzia* Kieffer and other genera considered to be related to that genus. Wirth (1974) assigned *Macrurohelea* to the tribe Stilobezziini and Wirth et al. (1974) included the genus in their key to the genera of Ceratopogonidae. Grogan and Wirth (1977), in their revision of the Nearctic *Parabezzia* Malloch stated that the male genitalia of *Macrurohelea* are similar to those of *Parabezzia*, and to the closely related *Fittkauhelea* Wirth and Blanton.

Subsequently, Grogan and Wirth (1979), in describing the new genus *Notiohelea* from Chile, remarked on the similarity of that genus and *Macrurohelea* to *Ceratopogon* Meigen. They stressed that all three of these genera possess sensilla coeloconica on the first flagellomere of the antenna, a character absent in *Stilobezzia* and its relatives. At least one species of *Macrurohelea*, *M. thoracica* Ingram and Macfie, has sensilla coeloconica present on flagellomeres 5-8 as well as on one. We have seen only one other species of Ceratopogonini possessing these sensilla beyond the first flagellomere, *Brachypogon fuscivenosus* (Lutz), which also has them on flagellomeres 2-4. We have not found any other ceratopogonids except for the Culicoidini with these sensilla on the distal flagellomeres.

On the basis of its sensillar characters, we assign *Macrurohelea* to the tribe Ceratopogonini. This placement of *Macrurohelea* is supported by its possession of pubescence between the eye facets. The genus is perhaps most closely related to *Ceratopogon* and is probably a sister group of that

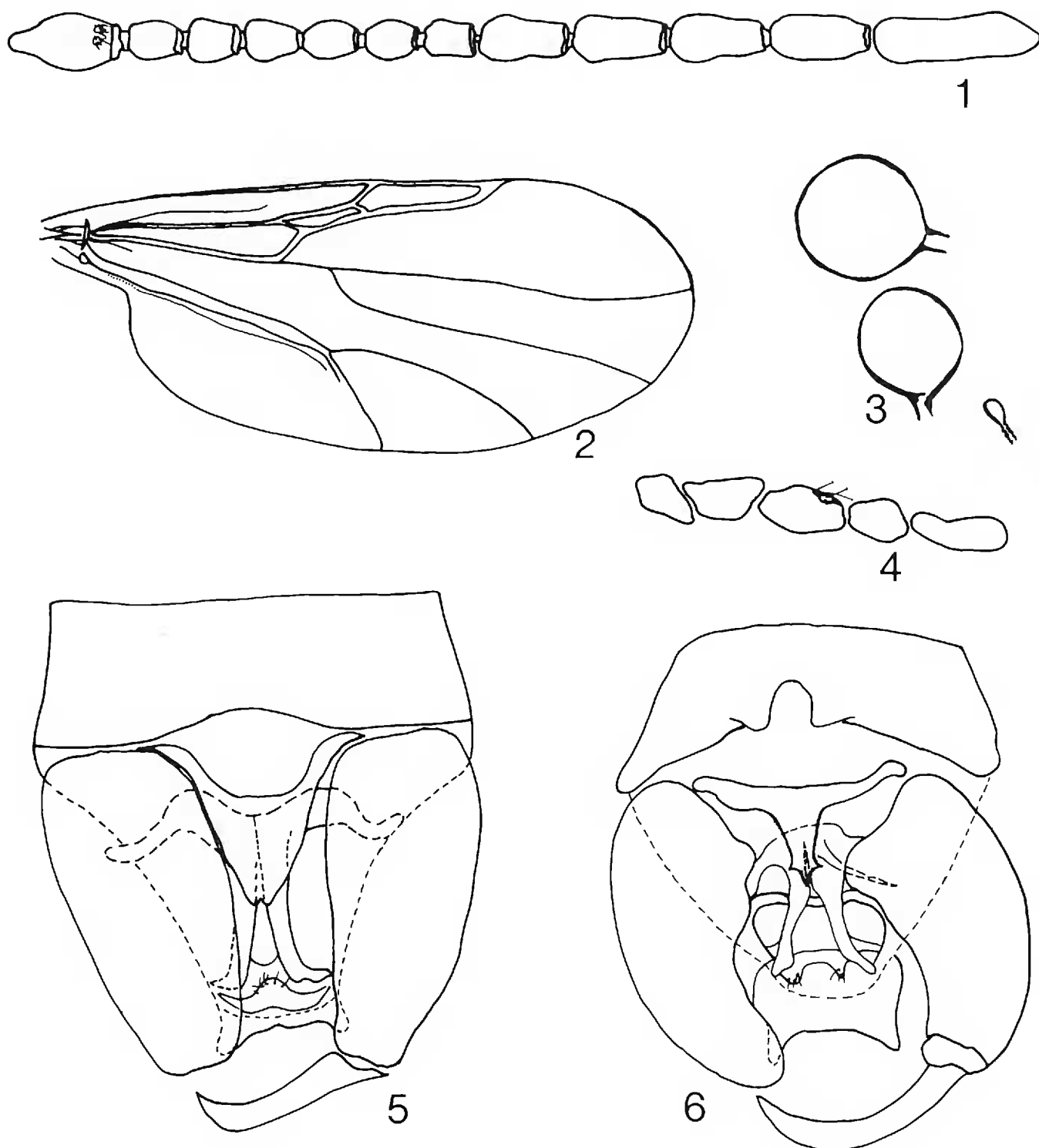
genus that is restricted to the southern hemisphere. *Ceratopogon* is a Holarctic genus, ranging north to at least 82°N latitude and probably as far south as 35°N. *Macrurohelea* exhibits a similar latitudinal distribution in South America.

In the present paper we describe two new species of *Macrurohelea* recently taken by M. E. Irwin in Chile. These descriptions increase the number of known species of the genus to seven, and there are probably many more yet to be discovered. An Australian species, *M. comuni* Lee (1962), is not included in the present key but is distinguished from all of the Neotropical species by having the second radial cell over four times the length of the first.

For an explanation of general ceratopogonid terminology see Wirth (1952); terms dealing with male genitalia are those of Snodgrass (1957); terminology of antennal sensilla follows Wirth and Navai (1978). We gratefully acknowledge the aid of Susan Powell, who prepared the illustrations.

#### Key to the Neotropical Species of *Macrurohelea*

- |   |   |
|---|---|
| 1. Females .....  | 2 |
| Males .....   | 6 |
| 2. Second radial cell of wing twice as long as the first .....  | 3 |
| Second radial cell at least 3 times as long as the first .....  | 4 |
| 3. Flagellum very short, flagellomeres 9–12 each broader than long, antennal ratio 0.59; very small species, wing length 0.94 mm ...      |   |
| ..... <i>kuscheli</i> Wirth   |   |
| Flagellum longer, flagellomeres 9–12 each twice as long as broad, antennal ratio 1.06–1.16; small species, wing length 1.27–1.42 mm ..... |   |
| ..... <i>irwini</i> new species   |   |
| 4. Small species, wing length 1.3–1.5 mm; intercalary fork of wing present .....  |   |
| ..... <i>caudata</i> Ingram and Macfie  |   |
| Larger species, wing length 2.1 mm or greater; intercalary fork of wing absent .....  | 5 |
| 5. Flagellomeres 5–8 with apical sensilla coeloconica; legs with inconspicuous setae; wing including the veins pale .....                 |   |
| ..... <i>thoracica</i> Ingram and Macfie  |   |
| Flagellomeres 5–8 lacking sensilla coeloconica; legs with numerous long bristly setae; wing including veins infuscated dark brown ..      |   |
| ..... <i>setosa</i> Wirth   |   |
| 6. Large species, wing length 2.1 mm or greater .....   | 7 |
| Smaller species, wing length less than 1.5 mm .....   | 8 |
| 7. Legs with numerous long bristly setae; wing including veins infuscated dark brown .....  |   |
| ..... <i>setosa</i> Wirth   |   |



Figs. 1-5. *Macrurohelea irwini*; 6, *M. paracaudata*. 1, female antenna; 2, female wing; 3, spermathecae; 4, female palpus; 5, 6, male genitalia.

- Legs with inconspicuous setae; wing including veins pale . . . . .  
 . . . . . *thoracica* Ingram and Macfie
8. Very small species, wing length 0.90 mm . . . *paracaudata* new species  
 Small species, wing length 1.3 mm or greater . . . . . 9
9. Intercalary fork of wing present; second radial cell subequal to first  
 . . . . . *caudata* Ingram and Macfie
- Intercalary fork of wing absent; second radial cell twice as long as  
 first . . . . . *irwini* new species

**Macrurohelea irwini**, new species  
(Figs. 1–5)

*Diagnosis.*—A small species of *Macrurohelea* distinguished by the following combination of characters: Wing length 1.27–1.43 mm, the second radial cell twice as long as the first; females with long antennal flagellum, flagellomeres 9–12 twice as long as broad, antennal ratio 1.06–1.16; males with tip of aedeagus bifid.

*Holotype female.*—Wing length 1.27 mm; breadth 0.50 mm.

*Head.*—Brown. Eyes pubescent; barely contiguous; facets broadly separated. Antenna with dark brown pedicel; flagellum (Fig. 1) with proximal eight flagellomeres globose, distal five flagellomeres more elongated, about twice as long as broad; first flagellomere with 2–3 apical sensilla coeloconica; proximal flagellomeres each with subbasal whorl of six sensilla chaetica and a central whorl of three long sensilla trichodea; distal five flagellomeres with scattered sensilla chaetica and sensilla basiconica; flagellomeres with lengths in proportion of 12-7-7-7-7-7-7-7-11-12-12-12-20; antennal ratio 1.10. Palpus (Fig. 4) light brown; lengths of segments in proportion of 6-12-11-7-12; third segment twice as long as broad with a small shallow apical pit bearing slender capitate sensilla. Mandible with 9–10 teeth, distal teeth longest.

Thorax: Dark brown with sparse scattered setae and fine pubescence. Legs uniform brown; femora with sparse setae, setae on tibiae moderately dense; first tarsomere of fore and hind legs with well developed palisade setae; fourth tarsomeres cordate; fifth tarsomeres about three times longer than broad with small equal simple claws. Wing (Fig. 2) hyaline, moderately broad, about 2.5 times longer than broad, veins grayish; second radial cell twice as long as first; costa extending to 0.70 of wing length; venation as figured. Halter stem light brown; knob pale.

Abdomen: Dark golden brown; covered with uniform, fine pubescence and a few scattered setae on sterna and terga. Tenth segment elongated and bent forward ventrally as is typical for members of the genus. Spermathecae (Fig. 3) heavily sclerotized, spheroid, subequal, with stout, moderately long necks.

*Allotype male.*—Similar to holotype female with the usual sexual differences. Wing length 1.43 mm; breadth 0.49 mm; costa extending to 0.62 of wing length; flagellum and fifth tarsomeres and claws of fore and mid legs lost. Genitalia as in Fig. 5. Ninth sternum about three times broader, than long, with a shallow caudomedian excavation; ninth tergum tapering rather abruptly distally to a narrow truncate apex bearing two short apicolateral processes, cerci very short and subapical to apicolateral processes. Basimere nearly straight, about twice as long as broad; telomere about half the length of basimere, curved gradually distally to pointed tip. Aedeagus triangular, slightly broader than long, moderately heavily sclerotized with deep

basal arch about  $\frac{1}{3}$  of total length; membrane spiculate but ventral surface of aedeagus bare; basal arms heavily sclerotized and recurved  $90^\circ$ ; distal portion tapering rather abruptly to slightly bifid tip. Claspettes nearly separated; basal arm very heavily sclerotized and doubly recurved; distal portion lightly sclerotized with tips bent at  $90^\circ$ .

*Variation.*—*Females.*—Wing length 1.37 (1.27–1.41,  $n = 4$ ); breadth 0.57 (0.50–0.61,  $n = 4$ ). Antennal ratio 1.11 (1.06–1.16,  $n = 3$ ).

*Distribution.*—Chile; known only from the type locality.

*Types.*—Holotype female, allotype male, 3 paratype females, Chile, Santiago Prov., Quebrada de la Plata Maipú,  $33^\circ30'S$ ,  $70^\circ55'W$ , 10 Aug. 1966, M. E. Irwin (Deposited in Calif. Acad. Sci., San Francisco; paratypes in U.S. National Museum and University of California, Riverside).

*Discussion.*—We take great pleasure in naming this species for its collector, Michael E. Irwin of the University of Illinois, in recognition of his contributions to our knowledge of Chilean Diptera.

*M. irwini* was taken at the same time and place as the holotype male of *M. paracaudata* n.sp. We are associating the single male of *M. irwini* with the females of this species because they are nearly identical in size, as is the case with other species in this genus.

This species appears to be most similar to *M. kuscheli* Wirth in having a small, short, broad wing with the second radial cell twice as long as the first. However, *M. kuscheli* differs from *M. irwini* in having a smaller wing (wing length 0.94 mm), shorter antenna (antennal ratio 0.59) with flagellomeres 9–12 broader than long. The male genitalia of *M. irwini* are distinctive and easily distinguished from those of other species by the broad triangular aedeagus with bifid tip.

### ***Macrurohelea paracaudata*, new species**

(Fig. 6)

*Diagnosis.*—A small species of *Macrurohelea*: males distinguished by the following combination of characters: Small size (wing length 0.90 mm); ninth sternum with distinct caudomedian notch bearing setose tubercles on each side; aedeagus with hastate tip.

*Holotype male.*—Wing length 0.90 mm; breadth 0.34 mm.

*Head.*—Brown. Eyes pubescent, moderately broadly separated. Pedicel of antenna dark brown; flagellum lost. Palpus light brown; segments shrunken and not measured; fifth segment more than twice as long as fourth.

*Thorax.*—Dark reddish brown with sparse scattered setae and fine pubescence. Legs uniform lighter brown; femora with sparse setae, tibiae with more dense setae; first tarsomere of fore and hind legs with well developed palisade setae; tarsi of mid legs and all but first tarsomere of hind leg lost;

fourth tarsomere of fore leg cordate; fifth tarsomere of fore legs slender with small, equal, simple claws. Wing similar to that of *M. irwini* n. sp. (Fig. 2); second radial cell about 1.4 times the length of first; costa extending to 0.64 of wing length. Halter lost.

*Abdomen*.—Dark golden brown. Genitalia as in Fig. 6. Ninth sternum with caudomedian notch bearing setose tubercles on each side; ninth tergum gradually tapering distally to a broad truncate tip bearing two rather long apicolateral processes; cerci short, subapical to apicolateral processes. Basimere greatly curved, nearly twice as long as broad with basal mesal lobe; telomere nearly the length of basimere, greatly curved to pointed tip. Aedeagus rather short, 1.3 times broader than long, heavily sclerotized with very shallow basal arch only about  $\frac{1}{4}$  of total length, membrane and ventral surface not spiculate; basal arm rather long and slender with recurved tip; distal portion very short and not as heavily sclerotized, the tip hastate or shaped like the point of a crowquill pen. Claspettes nearly fused at base; basal arm heavily sclerotized with slender, ventrally projecting portion; distal portion more lightly sclerotized with broad flat tip that bends at apex.

*Female*.—Unknown.

*Distribution*.—Chile; known from a single specimen from the type locality.

*Type*.—Holotype male, Chile, Santiago Prov., Quebrada de la Plata Maipo, 33°30'S, 70°55'W, 10 August 1966, M. E. Irwin (Calif. Acad. Sci.).

*Discussion*.—The affinities of *M. paracaudata* with other species of the genus are uncertain, but this species has a low aedeagus similar to that of *M. caudata* Ingram and Macfie, hence the specific name. *M. caudata* differs by having a straight stout basimere, a narrower ninth sternum, apex of ninth tergum lacking apicolateral processes, and wing with an intercalary fork.

### Literature Cited

- Grogan, W. L., Jr., and W. W. Wirth. 1977. A revision of the Nearctic species of *Parabezzia* Malloch (Diptera: Ceratopogonidae). *J. Kans. Entomol. Soc.*, 50:49–83.
- Grogan, W. L., Jr., and W. W. Wirth. 1979. *Notiohelea*, a new genus of biting midges of the tribe Ceratopogonini from Chile (Diptera: Ceratopogonidae). *Pan-Pacific Entomol.*, 54:283–286.
- Ingram, A., and J. W. S. Macfie. 1931. Ceratopogonidae. *Diptera of Patagonia and South Chile*, Part II, Fascicle 4, pp. 155–232.
- Lee, D. J. 1962. Australasian Ceratopogonidae (Diptera, Nematocera). Part IX. The genus *Macrurohelea*. *Proc. Linn. Soc. N.S.W.*, 87:339–340.
- Snodgrass, R. E. 1957. A revised interpretation of the external reproductive organs of male insects. *Smithson. Misc. Collect.*, 135:1–60.
- Wirth, W. W. 1952. The Heleidae of California. *Univ. Calif. Publ. Entomol.*, 9:95–266.
- Wirth, W. W. 1965. Two new species of *Macrurohelea* from Chile (Diptera, Ceratopogonidae). *Pan-Pacific Entomol.*, 41:46–50.

- Wirth, W. W. 1974. A catalogue of the Diptera of the Americas south of the United States. 14. Family Ceratopogonidae, pp. 1-89. Museu de Zoologia, Universidade de Sao Paulo, Brazil.
- Wirth, W. W., and S. Navai. 1978. Terminology of some antennal sensory organs of *Culicoides* biting midges (Diptera: Ceratopogonidae). *J. Med. Entomol.*, 15:43-49.
- Wirth, W. W., N. C. Ratanaworabhan, and F. S. Blanton. 1974. Synopsis of the genera of Ceratopogonidae (Diptera). *Ann. Parasitol. Hum. Comp.*, 49:595-613.

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## NOTICE

### BELTSVILLE AGRICULTURAL RESEARCH CENTER SYMPOSIUM V

The Beltsville Agricultural Research Center sponsors an annual research symposium with a specific theme. The subject of the fifth "BARC Symposium" will be "Biological Control in Crop Production." It is scheduled for May 19 to May 21, 1980. Subject matter will be presented as invited lectures and contributed posters with the lectures published in the BARC symposium series (5th volume). Previous symposia in this series were: (1) Virology in Agriculture, (2) Biosystematics in Agriculture, (3) Animal Reproduction, and (4) Human Nutrition Research: Questions and Answers.

Registration and a reception will be held Sunday evening followed by five technical sessions held Monday morning through Wednesday noon. The sessions are as follows:

- Session 1—Relevance of ecological theories to practical biological control.  
Session 2—Concepts, principles and mechanisms of biological control of pests.  
Session 3—Recent advances in mass production of biological control agents.  
Session 4—Strategies of biological control.  
Session 5—General considerations: Environmental, regulatory, safety, economic and biocontrol in integrated pest management systems.

Voluntary poster presentations will be held Monday from 5:30 to 7:30 pm.  
Registration fee \$60.00.

Anyone wishing to receive a registration packet for this symposium should contact:

Publicity Chairman, Symposium V, Room 214, Bioscience Bldg 011A, BARC-West, Beltsville, Md. 20705.